Electronic Version
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Claims

[c1] 1.A visually-dazzling multi-light-emitting diode (LED) display comprising:
a pattern-decoding generator that receives an activity signal that indicates occurrence of an activity, the pattern-decoding generator generating a sequence of data signals onto a plurality of data lines; and
a plurality of LED's, coupled to the pattern-decoding generator by the plurality of data lines, the plurality of LED's being driven with the sequence of data signals on the plurality of data lines;
wherein the sequence of data signals comprises at least four unique states of the data signals, producing a visual sequence of at least four visually different combinations of illuminated LED's in the plurality of LED's,
whereby visually different combinations of illuminated LED's are generated by the pattern-decoding generator.

[c2] 2.The visually-dazzling multi-light-emitting diode display of claim 1 further comprising:
a memory controller that controls access to a memory, the memory controller generating the activity signal when the memory is being accessed.

[c3] 3.The visually-dazzling multi-light-emitting diode display of claim 2 wherein the memory controller is a flash memory controller and the memory is a flash memory.

[c4] 4.The visually-dazzling multi-light-emitting diode display of claim 3 wherein the memory controller further comprises a Universal-Serial-Bus (USB) flash controller that connects to a host through a USB bus.

[c5] 5.The visually-dazzling multi-light-emitting diode display of claim 4 further comprising:
a general-purpose bus coupled between the USB flash controller and the pattern-decoding generator;
wherein the USB flash controller sends commands over the general-purpose bus to the pattern-decoding generator to control the sequence of data signals on the plurality of data lines and the visually different combinations of illuminated LED's.

[c6] 6.The visually-dazzling multi-light-emitting diode display of claim 5 wherein the commands sent over the general-purpose bus include commands to hold a current combination of illuminated LED's, to cycle the sequence, or to illuminate a single LED, and to adjust voltage on the plurality of data lines.

[c7] 7.The visually-dazzling multi-light-emitting diode dis-

play of claim 2 wherein the plurality of LED's comprises at least 4 LED's and the plurality of data lines comprises at least 4 data lines.

[c8] 8.The visually-dazzling multi-light-emitting diode display of claim 7 wherein the plurality of LED's comprises at least 8 LED's and the plurality of data lines comprises at least 4 data lines;
wherein each data line connects to two LED's in the plurality of LED's,
wherein two LED's are simultaneously driven at a time by the pattern-decoding generator.

[c9] 9.The visually-dazzling multi-light-emitting diode display of claim 7 wherein each LED in the plurality of LED's comprises a multi-color LED having three data inputs for receiving three data lines of the plurality of data lines, each of the three data inputs for controlling illumination of a different color.

[c10] 10.The visually-dazzling multi-light-emitting diode display of claim 9 wherein each multi-color LED further comprises:
a shared resistor that receives current from all three data inputs after passing through a light-emitting element;
a shared output, connected to the shared resistor;
wherein each multi-color LED has three data inputs and

one shared output.

[c11] 11.The visually-dazzling multi-light-emitting diode display of claim 2 wherein the pattern-decoding generator comprises:
an address generator that is clocked by the activity signal, the address generator incrementing an N-bit address in response to the activity signal;
an address decoder, receiving the N-bit address from the address generator, for decoding the N-bit address to drive the plurality of data lines that comprise M data lines, wherein M is larger than N.

[c12] 12.The visually-dazzling multi-light-emitting diode display of claim 11 wherein only one of the M data lines is activated for each data word in the sequence of data signals.

[c13] 13.The visually-dazzling multi-light-emitting diode display of claim 2 further comprising:
flexible printed-circuit board (PCB) having wiring traces formed thereon;
wherein the plurality of LED's are mounted on the flexible printed-circuit board.

[c14] 14.The visually-dazzling multi-light-emitting diode display of claim 13 wherein the pattern-decoding generator

is also mounted on the flexible printed-circuit board.

[c15] 15.A portable memory device comprising:
a memory;
a device controller that receives commands from a host over a serial bus and controls access to the memory for the host;
wherein the device controller generates an activity signal when the memory is being accessed;
a pattern-decoding generator that receives the activity signal from the device controller, the pattern-decoding generator generating a sequence of data signals on a plurality of data lines, the sequence being activated in response to the activity signal; and
a display having a plurality of light-emitting diodes (LED's) that are driven by the plurality of data lines from the pattern-decoding generator to produce a visually changing sequence of illuminated LED's;
wherein the visually changing sequence of illuminated LED's comprises at least four visually different states, whereby the visually changing sequence on the display is generated when the memory is being accessed.

[c16] 16.The portable memory device of claim 15 wherein the serial bus is a Universal-Serial-Bus (USB), a PCI Express bus, an ExpressCard bus, a Firewire IEEE 1394 bus, a serial ATA bus, or a serial attached small-computer system

interface bus.

[c17] 17.The portable memory device of claim 15 wherein the visually changing sequence on the display comprises a circular sequence on a round-circle multi-LED display, a linear-display pattern sequence on a linear display, a dual linear-display pattern sequence, or a dual circular pattern sequence.

[c18] 18.A portable device with a visually-dazzling display comprising:
memory means for storing user data for a user of a host;
device controller means, coupled to the memory means and for coupling to the host, for generating an activity signal when the memory means is accessed;
pattern generating means, coupled to receive the activity signal from the device controller means, for driving a sequence onto a plurality of display-data lines; and
multi-light display means, having a plurality of display elements that are separately illuminated in response to the plurality of display-data lines;
wherein the multi-light display means has at least four display elements;
wherein the sequence driven onto the plurality of data lines produces a visually changing sequence of illuminated display elements that comprises at least four visually different states in the sequence.

[c19] 19.The portable device with a visually-dazzling display of claim 18 wherein each data line connects to at least two of the display elements including a first display element in a first display section and a second display element in a second display section;
wherein the multi-light display means is a dual display with the sequence being displayed on both the first display section and on the second display section.

[c20] 20.The portable device with a visually-dazzling display of claim 18 further comprising:
flexible printed-circuit board means for supporting the display elements in the multi-light display means and for supporting the pattern generating means;
wiring means, on the flexible printed-circuit board means, for connecting the plurality of data lines from the pattern generating means to the display elements.